# SECTION 6

# MINIMUM REQUIREMENT #5

# ON-SITE STORMWATER MANAGEMENT

## Existing Site Hydrology

The site has two drainage basins, one that drains to the south toward SR 2 thru Sinclair Heights project, which we are calling the south basin. To the north is the smaller of the two basins that drains overland to the north to Chain Lake Road, and eventually west under SR 2 to the Snohomish River Valley.

South Basin:
The south basin storm runoff currently flows overland to the south and east where it enters an adjacent wetland, and then into the drainage infrastructure of the "Sinclair Heights" subdivision. This happens initially thru a drainage pipe that drains the wetland under 199$^{th}$ avenue SE. flows then continue to the south and then along the west side of chain lake road where they eventually go overland in a long flat wetland to the west, just after the recently proposed carriage place subdivision.

North Basin:
The North basin is the portion of the site that drains north to Chain Lake Road. Most of this drainage is in the form of sheet flow from the adjacent sites. There is a portion of this drainage that is generated from the existing utility easement maintenance road. This road drains to a roadside ditch along its west where it flows into a pipe that daylights in the Chain Lake Road roadside ditch.

## Developed Site Hydrology

South Basin:

The south basin that contains the vast majority of the site, will contain a large detention pond. This pond will be located at the south end of the site and will be made completely of earthen berms and cut slopes. The pond will have 1' of dead storage for sediment removal and a biofiltration swale downstream of the detention pond. The biofiltration swale will discharge to a level spreader which will disperse flows into the adjacent wetland to the south of the site. The pond will be fitted with an emergency overflow structure, or "Bird Cage" that will be fitted on the frop T orifice release structure, and then a secondary emergency overflow spillway over the south bank of the detention pond. This secondary emergency overflow will be armored with quarry spalls and will also drain south into the adjacent wetland. The detention pond has been designed utilizing the latest version of WWHM3 continuous storm modeling software as per the 2005 DOE manual for existing versus proposed drainage release rates. The point of compliance is the location where the flows leave the proposed level spreader, which is the southernmost portion, and the point of the lowest elevation of the site.

North Basin:

The northern basin which is a very small portion of the site (3.6 acres of the total 35 acres), will be released to the north in its natural drainage course toward Chain Lake Road. Of the developed portion of the north basin, only the downhill 0.83 acres will be released to the north. The remainder of the plat in the north basin (2.77 acres) will be diverted to the south basin and into the proposed detention pond. This is due to the fact that the several utility (natural gas, domestic water) easements within this north basin make it very difficult to design a detention system within this north basin. And by over detaining in the south basin, within the existing detention pond, we are able to eliminate the need for two detention systems. Thus providing a more cost efficient storm drainage system, with much less maintenance for the city of Monroe and the homeowners association to operate and maintain. This 0.83 acres was chosen to keep the developed release rates .vs. pre-developed rates to the north basin within the guidelines of the 2005 DOE manual, thus meeting all Point of Compliance (POC) release rate criteria for the entire site, while utilizing one detention pond.

## Performance Standards

Flow Control and Stormwater Quality elements are subject to the requirements of the 2005 Washington State Department of Ecology Stormwater Management Manual for the Puget Sound Basin. The modeling software used for both water quality treatment design flows and volumes, and detention volume calculations and release rates is version 3.0 of the WWHM3 Continuous Stormwater Modeling Software.

The specific performance standards the WWHM3 model uses to establish a "passing" detention facility are as follows:
Stormwater discharges shall match developed discharge durations to pre-developed durations for the range of pre-developed discharge rates from 50% of the 2-year peak flow up to the full 50-year peak flow. The pre-developed condition to be matched shall be a forested land cover unless specific basin characteristics existed otherwise prior to 1985.